

## PATENT SPECIFICATION

DRAWINGS ATTACHED

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## COMPLETE SPECIFICATION

## A Disinfecting or Deodorising Device for Flushing Cisterns

We, THORNTON & ROSS LIMITED, of The Chemical Works, off Manchester Road, Linthwaite, Huddersfield, in the County of York, a British Company, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The present invention provides a device for supplying a small charge of liquid disinfectant or deodorant to the interior of the cistern of a water closet or like flushing cistern each time the cistern is flushed. The term "disinfectant" will be used throughout this specification but is intended to include deodorants and water softeners.

According to this invention, a disinfecting device for use in a flushing cistern has a discharging member which is bouyant in water and which is adapted to receive a charge of liquid disinfectant from a reservoir, there being means for causing the discharging member to tilt to a position where the charge of disinfectant will flow out of it, whenever the water level in the cistern falls below the minimum level required to support the discharging member.

According to a preferred feature of the invention, the device incorporates a flexible reservoir with an outlet at its upper end leading into the discharging member and weighting means for holding the reservoir below water level, whereby a disinfectant having a specific gravity lower than that of water will tend to flow upwardly out of the reservoir when the latter is in its working position.

The construction and method of operation of a disinfecting device in accordance with the invention will now be particularly described by way of example only, with reference to the accompanying drawing which is a section through a flushing cistern showing the disinfecting device in position.

In the drawing 1 is the cistern (all the internal mechanism of which has been omitted

from the drawing, because it is immaterial to the invention) and 2 is the water in the cistern. The water is shown at the "full level"; when the cistern is flushed almost all the water flows out of it.

The disinfecting device comprises essentially a flexible bag reservoir 3 and a discharging member 4. The flexible bag 3 is made of polythene sheet and is provided with a small outlet hole 5 at its upper end, and a glass rod 6 which provides a weight at its bottom end. The length of the bag 3 is such that it will float upright in the water, with its weight 6 just clear of the floor of the cistern when its outlet hole 5 is just below the surface of the water. It should be understood that the device is intended to use a liquid disinfectant (indicated at 7) having a lower specific gravity than that of water, so that the disinfectant will cause the bag to be bouyant in water.

The discharging member 4 is made as a synthetic plastics moulding, and comprises a cylindrical cup 8 having a pouring lip 9, and a feed tube 10 which extends above and below the base 11 of the cup 8. The cup 8 fits into a hole 12 in a foam synthetic plastics float 13 which holds the cup upright, and gives it the correct buoyancy.

The feed tube 10 is fitted into the outlet hole 5 of the bag 3, and the latter is held in position on the discharging member by a rubber ring 14 which fits around the part of the bag which engages over the tube 10. As illustrated in the drawing, the buoyancy of the discharging member and its associated float is so related to the specific gravity of the disinfectant 7, that although the discharging member floats on the water 2, the upper end of the feed tube 10 lies below the water level, and consequently, disinfectant 7 is forced out of the bag 3 (by pressure of the water 2 acting on the bag) up into the annular space between the upper part of the feed tube 10 and the cylindrical wall of the cup

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8. The level of the upper end of the tube 10 relatively to the water level can be adjusted by altering the size of the float 13.

5 A cord 15 is attached at one end to a tab 16 on the discharging member 4, and at its other end to a hook 17 which is adapted to engage over the top edge of the wall of the cistern 1. The length of the cord 15 is such that when the water level falls, the cord is pulled tight, and the member 4 is tilted.

10 In use, the hook 17 is engaged with the cistern wall, and the bag 3, full of disinfectant 7, is lowered into the water. The member 4 then floats in the water, and a small quantity of disinfectant flows up the feed tube 10, and into the cup 8. The level of the liquid in the cup will be at or very slightly above the water level. The liquid in the cup 8 constitutes a single charge (so that the discharging member forms a metering device) and the quantity of this charge is determined by the buoyancy of the assembly, the dimensions of the cup and the surface tension of the disinfectant. The design of the member 4, therefore, determines the size of each charge.

When the cistern is flushed, the water level falls rapidly, and the float 13 is tilted when the cord 15 becomes taut, emptying the contents of the cup 8 into the water. Disinfectant cannot continue to pour out of the hole 5, however, and indeed when the member 4 is tilted, there is a slight suction back into the bag 3, because the hydrostatic balance has been changed by the lowering of the water, and the bag being very flexible the system can be compared to the U tube in which alteration of the liquid level in one limb immediately affects the liquid level in the other limb.

40 The discharge liquid provides the disinfecting action, and it should be noted that the disinfectant is supplied to the water which is released from the cistern at a time when there is turbulence in the water, which assists in dispersing the disinfectant.

45 When the cistern is completely flushed, the bag 3 hangs by the cord 15, with the liquid 7 having fallen to the bottom of the bag, air also possibly being present in the bag, and the float tilted to an angle which can approach the vertical.

When the water level rises again, the member 4 is refloats, and disinfectant flows upwardly into it ready for the next operation of the cistern.

#### WHAT WE CLAIM IS:—

1. A disinfecting device for use in a flush-

ing cistern having a discharging member which is buoyant in water, and which is adapted to receive a charge of liquid disinfectant from a reservoir, there being means for causing the discharging member to tilt to a position where the charge of disinfectant will flow out of it, whenever the water level in the cistern falls below the minimum level required to support the discharging member.

2. A disinfecting device as claimed in Claim 1, which incorporates a flexible reservoir with an outlet at its upper end leading into the discharging member and weighting means for holding the reservoir below water level, whereby a disinfectant having a specific gravity lower than that of water will tend to flow upwardly out of the reservoir when the latter is in its working position, to partly fill the discharging member.

3. A disinfecting device as claimed in Claim 2, wherein the reservoir is a bag made of synthetic plastics sheet.

4. A disinfecting device as claimed in any one of Claim 1 to 3, in which the discharging member comprises a cup and a feed tube leading into the cup.

5. A disinfecting device as claimed in Claim 4, in which the feed tube extends above the bottom of the cup to provide an annular space between the tube and the walls of the cup.

6. A disinfecting device as claimed in either of Claims 4 and 5, in which the feed tube extends below the cup to provide an attachment for the reservoir.

7. A disinfecting device as claimed in any one of the preceding claims, in which the discharging member is provided with a float.

8. A disinfecting device as claimed in any one of the preceding claims, in which a cord is provided to connect the discharging member with the wall of the cistern.

9. A disinfecting device for a flushing cistern as claimed in Claim 1, constructed and arranged substantially as herein described with reference to the accompanying drawing.

10. A method of disinfecting a flushing cistern, substantially as herein described with reference to the accompanying drawing.

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COMPLETE SPECIFICATION

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*This drawing is a reproduction of  
the Original on a reduced scale*

